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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,255	12/21/2001	Ian Glenn Towe	T8465082US	3346

7590 08/24/2004

ARNE I. FORS
GOWLING, STRATHY & HENDERSON
SUITE 4900
COMMERCE COURT WEST
TORONTO, ON M5L 1J3
CANADA

EXAMINER

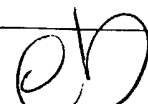
TESKIN, FRED M

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/024,255	TOWE ET AL.	
	Examiner	Art Unit	
	Fred M Teskin	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 10-14 is/are pending in the application.
- 4a) Of the above claim(s) 2-6 and 10-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 13 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

The response of April 23, 2004 has been entered in full and is deemed to obviate the rejection under 35 U.S.C. 112 and the prior art rejections as set forth in the previous Office action.

Claims 2-6 and 10-12 stand withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to non-elected species and a non-elected invention, respectively. Election was made without traverse in paper no. 11.

The previously indicated allowability of claim 8 (now cancelled, with the subject matter thereof incorporated in claim 1) is withdrawn in view of the newly discovered prior art to Terada et al and Mahlman. A rejection over the new references follows.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over USP 6338784 to Terada et al in view of USP 3665059 to Mahlman and the evidence provided by Schwartz et al, Plastics Materials and Processes ("Schwartz").

Claim 1 is drawn to a heterogeneous ion exchange material comprising a binder where the binder comprises a thermoplastic elastomer olefin comprising a

polypropylene continuous phase with an ethylene-propylene-diene monomer or ethylene-propylene rubber rubbery phase dispersed through the polypropylene continuous phase. Claims 13 and 14 are directed to the thermoplastic elastomer olefin wherein the dispersed phase is, respectively, ethylene-propylene-diene monomer and ethylene-propylene rubber.

Terada et al discloses, as a preferred embodiment, a heterogeneous ion-exchange membrane comprising an ion exchange resin and a binder polymer (col. 3, lines 43-46) where the binder polymer can be, e.g., low density polyethylene, polypropylene or "a mixture thereof with a flexible rubber material" (col. 4, lines 7-12).

With regard to the thermoplastic nature of both polyethylene and polypropylene, Schwartz provides evidence that both polymers are well known thermoplastics (see page 42, second paragraph of left-hand column and page 43, Table 5-1). Further, as regards the identity of the flexible rubber material, Terada et al state: "a rubber consisting of one or both of ethylene-propylene rubber (EPR) or ethylene-propylene-diene rubber (EPDM), is a particularly preferred polymer from the viewpoint of the elongation, flexibility and the strength of the resulting ion exchange membranes" (col. 4, lines 13-17). Although Terada et al prefer the use of a mixture of polyethylene and EPR, this is merely a preferred embodiment and as such does not exclude or teach away from the mixture of polypropylene and EPR also disclosed therein as useful, as noted above. It will be noted, of course, that polyethylene and polypropylene are adjacent homologous members in the polyolefin family.

Thus the difference between claims 1, 13 and 14 and Terada et al is the requirement in claim 1 that the binder comprises a mixture of a polypropylene continuous phase and EPR or EPDM dispersed through that continuous phase.

In this regard, attention is drawn to Mahlman, wherein there is disclosed a polyphasic mixture of a polypropylene continuous phase and a second amorphous phase. Examples of the amorphous phase are EPR and EPDM (col. 5, lines 34-36). Moreover, Mahlman teaches the benefits in properties provided by such a mixture, e.g., increased strength and elongation (*id.*, lines 45-51). Terada et al likewise express preference for EPR and EPDM from the standpoint of the elongation, flexibility and the strength of the resulting ion exchange membranes, as noted above.

In view of the advantageous properties possessed by a mixture of a polypropylene continuous phase and a second amorphous phase such as EPR or an EPDM-type rubber as taught by Mahlman, it would have been obvious to one of ordinary skill in the art to have used such a mixture instead of the polyethylene and EPR mixture as a binder polymer in the invention of Terada et al and thereby arrive at the presently claimed invention as described in claims 1, 13 and 14.

In view of the new grounds of rejection *supra*, this action is made non-final.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner F. M. Teskin whose telephone number is


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(571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FMTeskin/08-23-04



FRED TESKIN
PRIMARY EXAMINER
1713